

PAT-NO: JP405059103A  
DOCUMENT-IDENTIFIER: JP 05059103 A  
TITLE: PRODUCTION OF CONJUGATED DIENE POLYMER  
PUBN-DATE: March 9, 1993

INVENTOR-INFORMATION:

NAME  
IKEMATSU, TAKESHI  
MIYAMOTO, KOICHI

ASSIGNEE-INFORMATION:

NAME	COUNTRY
ASAHI CHEM IND CO LTD	N/A

APPL-NO: JP03240175

APPL-DATE: August 28, 1991

INT-CL (IPC): C08C019/36, C08F036/04 , C08J003/24

US-CL-CURRENT: 526/154

ABSTRACT:

PURPOSE: To obtain a conjugated diene polymer having excellent rubber properties and processability by polymerizing a conjugated diene in the presence of a composite catalyst consisting of an organic compound of a rare-earth element, an organoaluminum compound and a halogen-containing Lewis acid compound and adding and reacting a specific coupling agent to the polymerization product.

CONSTITUTION: A conjugated diene (preferably 1,3-butadiene and/or isoprene) is polymerized in the presence of a composite catalyst consisting of (A) an organic compound of a rare-earth element such as lanthanum, (B) an

organoaluminum compound such as triethylaluminum and (C) a halogen-containing Lewis acid compound such as halide of aluminum element and the obtained polymer is made to react with a carboxylic acid compound consisting of a carboxylic acid, an acid halide and/or an acid anhydride as a coupling agent to obtain the objective diene polymer having low solution viscosity.

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DERWENT-ACC-NO: 1993-121407

DERWENT-WEEK: 200176

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TITLE: High molecular wt. conjugated diene! polymer  
for high quality rubber - by polymerisation of  
conjugated diene in presence of catalyst contg. organic rare earth  
cpd., organo-aluminium cpd. and Lewis acid, and  
reacting with coupling agent

PATENT-ASSIGNEE: ASAHI CHEM IND CO LTD[ASAH]

PRIORITY-DATA: 1991JP-0240175 (August 28, 1991)

PATENT-FAMILY:

PUB-NO	PUB-DATE	LANGUAGE
PAGES MAIN-IPC		
<u>JP 05059103 A</u>	March 9, 1993	N/A
009 C08C 019/36		
JP 3230532 B2	November 19, 2001	N/A
007 C08C 019/36		

APPLICATION-DATA:

PUB-NO	APPL-DESCRIPTOR	APPL-NO
APPL-DATE		
JP 05059103A	N/A	1991JP-0240175
August 28, 1991		
JP 3230532B2	N/A	1991JP-0240175
August 28, 1991		
JP 3230532B2	Previous Publ.	JP 5059103
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INT-CL (IPC): C08C019/36, C08F036/04 , C08J003/24 , C08L009:00

RELATED-ACC-NO: 2001-459785

ABSTRACTED-PUB-NO: JP 05059103A

BASIC-ABSTRACT:

Prepn. comprises (1) polymerisation of conjugated diene (II) by  
bulk-polymerisation or soln. polymerisation in presence of catalyst

(III)

composed of (a) organic rare earth metal cpd. (IIIa), (b) organoaluminium cpd.

(IIIb) and (c) halogen-contg. Lewis acid (IIIc), and (2) reaction of the

polymer (IV) with coupling agent (V) selected from carboxylic acid (Va),

carboxylic halide (Vb) and carboxylic anhydride (Vc).

Catalyst is prep'd. from (1) (IVa)  $\text{LnY}_3$  (where Ln = rare earth metal, pref. Nb;

y = acid residue) in an amt. of 0.01-5 mmol. per 100g of (II), (2) (IVb)

$\text{AlR}_1\text{R}_2\text{R}_3$  (where  $\text{R}_1$  = 1-20C (pref. 2-8C) aliphatic hydrocarbon residue, 6-20C

(pref. 6-12C) alicyclic hydrocarbon residue, 6-20C (pref. 6-12C) aromatic

hydrocarbon residue opt. subst'd. with alkyl; l = 0, 1, 2, pref. 0, 1) in an

amt. of 0.5-10 mmol. per 100g of (II), and (3) IVc) diethylaluminium chloride,

ethylaluminium sesquichloride, ethylaluminium dichloride, diethylaluminium

bromide, ethylaluminium sesquibromide, ethylaluminium dibromide, halogen/Ln =

1-6, pref. 2-4. The coupling agent is  $\text{R}_1-(\text{COOH})_n$ ,  $\text{R}_2-(\text{COX})_n$ ,  $\text{R}_3-\text{C}(\text{O})\text{OC}(\text{O})\text{R}_4)_n$ , etc. where  $\text{R}_1$ -3 are 1-10,000C (pref. 1-100C)

aliphatic-,

alicyclic-, aromatic-hydrocarbon residue;  $\text{R}_4$  is 1-50C (pref. 1-20C)

aliphatic-,

alicyclic- or aromatic-hydrocarbon residue; X is halogen (pref. Br, Cl); and n

is integer 1-5000 (pref. 1-10). (II) is polymerised at -30 to 150 deg.C.

(pref. 30-100 deg.C.) in the presence of (IV). After polymerisation, coupling

agent is added to the polymerisation system to become coupling agent per Al-C

bond to 0.01-1.5 (pref. 0.1-1) equiv., the resulting matter is stirred at the

same temp. to polymerisation temp. to obtain (I).

USE/ADVANTAGE - (I) is useful as rubber material. Using (IV) as catalyst

instead of former organic rare earth metal cpd. catalyst, butadiene polymers

having higher molecular wt., narrow molecular wt. distribution and high

cis-bond content is obtd. in high yield. (I) have more branched structure,

lower soln. viscosity, superior rubber property and mouldability than  
former  
conjugated diene polymers prepd. by using former

CHOSEN-DRAWING: Dwg.0/0

TITLE-TERMS: HIGH MOLECULAR WEIGHT CONJUGATE POLYDIENE POLYMER HIGH  
QUALITY

RUBBER POLYMERISE CONJUGATE DIENE PRESENCE CATALYST  
CONTAIN ORGANIC

RARE EARTH COMPOUND ORGANO ALUMINIUM COMPOUND LEWIS ACID  
REACT

COUPLE AGENT

DERWENT-CLASS: A12 E12

CPI-CODES: A02-A06C; A02-A07A; A02-B; A04-B01A; E05-B02; E05-M;

CHEMICAL-CODES:

Chemical Indexing M3 \*01\*

Fragmentation Code

A700 A760 A960 B415 B701 B711 B720 B813 B815 B831  
C710 H102 H181 H401 H498 H9 J011 J171 M210 M211  
M212 M213 M214 M215 M216 M220 M221 M222 M223 M224  
M225 M226 M231 M232 M233 M250 M262 M271 M272 M273  
M281 M282 M283 M320 M411 M510 M520 M530 M540 M630  
M782 M903 M904 Q121

Markush Compounds

199315-C8901-C 199315-C8901-M 199315-C8902-C 199315-C8902-M

Chemical Indexing M3 \*02\*

Fragmentation Code

A313 A921 A923 A940 C017 C100 C710 G010 G019 G020  
G021 G029 G040 G050 G100 G111 G112 G221 G299 G553  
G563 G599 M210 M211 M212 M213 M214 M215 M216 M220  
M221 M222 M223 M224 M225 M226 M231 M232 M233 M250  
M281 M411 M510 M520 M530 M531 M532 M533 M540 M541  
M542 M543 M782 M903 M904 Q121

Markush Compounds

199315-C8903-C 199315-C8903-M 199315-C8904-C 199315-C8904-M  
199315-C8905-C

199315-C8905-M 199315-C8906-C 199315-C8906-M 199315-C8907-C  
199315-C8907-M

199315-C8908-C 199315-C8908-M

UNLINKED-DERWENT-REGISTRY-NUMBERS: 0639U; 1381U ; 5194U

POLYMER-MULTIPUNCH-CODES-AND-KEY-SERIALS:

Key Serials: 0009 0037 0038 0181 0230 1059 1083 1093 2049 2051 2054